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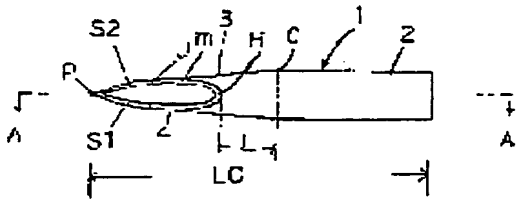
(54) BLOOD TAKING NEEDLE

(57)Abstract:
PROBLEM TO BE SOLVED: To facilitate pricking of a needle to the blood vessel so as to lessen the pain incurred on a blood donor, to make the incision wound of the blood vessel small, to expedite the restoration of damage to the blood vessel tissues and to increase the inflow rate of the blood by forming a main bevel and side bevels at the front end of a small-diameter tube stock and arranging the rear end of the main bevel on the small-diameter tube stuck.



SOLUTION: This blood taking needle 1 is composed of the tube stock 2 and the small-diameter tube stock 3 formed in front of the tube stock 2. A blade surface 4 consisting of the main bevel (m) and the side bevels S1, S2 is formed on the front end of the stuck stock 3 of the diameter smaller than the outside diameter of the tube stock 2. The rear edge H of the blade surface 4 is arranged on the small-diameter tube stock 3. The blood taking needle 1 is produced by grinding the front end of the small-diameter tube stock 3 formed by drawing the front end of the tube stock 2 to a conical shape to form the main bevel (m) and in succession, grinding the front end of the main bevel (m), thereby forming the side bevels S1, S2. Then, the incision width of the blood vessel by the blade surface 4 at the time of pricking the blood vessel is made smaller than the outside diameter of the tube stock 2.

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CLAIMS

[Claim(s)]
[Claim 1] The blood collecting needle 1 characterized by having consisted of narrow diameter element tubes 3 (13) formed ahead of the element tube 2 (12) which has an outer diameter D0, and this element tube 2 (12), having formed the Maine bevel m and the side bevels S1 and S2 in the point of the narrow diameter element tube 3 (13), and having arranged the trailing edge H of the Maine bevel m on the narrow diameter element tube 3 (13) (11).
[Claim 2] The Maine bevel m, the side bevel S1, the blood collecting needle 1 according to claim 1 characterized by forming the rate of height DJ of the drainage divide J formed among S2 to DJ/DBx100 <=50% to the overall height DB of m.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the blood collecting needle in the case of collecting blood from a body peripheral vein and an artery with a medical supply.
[0002]
[Description of the Prior Art] As shown in drawing 10 (drawing 11 is the D-D sectional view of drawing 10), after the conventional blood collecting needle 31 carries out grinding of the element tube 32 which has a fixed outer diameter to a predetermined include angle and forms the Maine bevel m, change a grinding include angle, a circumferencial direction is made to carry out predetermined include-angle rotation of the element tube 32, grinding formation of one side bevel S1 is carried out, the above-mentioned include angle carries out the amount reversal of 2 double of the element tube 32 again, and it carries out grinding formation of the side bevel S2 of another side. as there was no constraint special about the location on the Maine bevel m of the drainage divide J formed from the Maine bevel m and the side bevels S1 and S2 and the angiotomy width of face by the blood vessel puncture was shown in drawing 12 , the element tube 32 was made until outer-diameter full.
[0003] More little damage on a blood vessel is wanted for the needle used when extracting the blood for transfusion or the blood as a blood product raw material from a body peripheral vessel, and when [in order to carry out extracorporeal circulation of the blood in blood purification therapies artificial dialysis and various / other /,] collecting blood using a peripheral vessel and carrying out the re-transfusion of the blood after purification to have little pain with which blood vessel puncture resistance runs through smoothly few and which it gives to a blood collecting person, and for there to be many amounts of blood collecting per unit time amount, and for there to be. Since the blood for transfusion in our country or the blood as a blood product raw material is offered gratuitously from a well-intentioned donor, pain given to the donor accompanying blood collecting actuation should be made the minimum. Moreover, it is very important for an extracorporeal circulation blood purification therapy on a therapy action that vascular injury is the minimum so that promptly [a short period of time / there may be much ****** crack ****** and / damage restoration of a patient's blood vessel blood collecting part]. The conventional blood collecting needle 31 did not have enough consideration of this point. Then, the pain of this invention given to a blood collecting person that it is easy to run through a blood vessel is small, the angiotomy blemish accompanying **** is small, and restoration of blood vessel tissue damage is quick, and aims at offer of a blood collecting needle with a large blood inflow.
[0004]
[Means for Solving the Problem]
[1] It consists of narrow diameter element tubes 3 (13) formed ahead of the element tube 2 (12) which has an outer diameter D0, and this element tube 2 (12), form the Maine bevel m and the side bevels S1 and S2 in the point of the narrow diameter element tube 3 (13), and offer the blood collecting needle 1 (11) which has arranged the trailing edge H of the Maine bevel m on the narrow diameter element tube 3 (13).

[2] Offer the Maine bevel m, the side bevel S1, and the blood collecting needle 1 of [1] which formed the rate of height DJ of the drainage divide J formed among S2 to DJ/DBx100 <=50% to the overall height DB of m.
[0005]
[Embodiment of the Invention] Drawing 1 is the top view (drawing 2 is the A-A sectional view of drawing 1) of the blood collecting needle 1 of this invention, and the blood collecting needle 1 consists of narrow diameter element tubes 3 formed ahead of the element tube 2 and the element tube 2, from the outer diameter D0 of an element tube 2, it forms the blade surface 4 which consists of a Maine bevel m and side bevels S1 and S2 at the tip of the narrow diameter element tube 3, and arranges the trailing edge H of a blade surface 4 on the narrow diameter element tube 3. The blood collecting needle 1 is manufactured by carrying out grinding of the tip of the narrow diameter element tube 3 by which spinning was carried out to the shape of a cone in the tip of an element tube 2 as shown in drawing 3 , forming the Maine bevel m, continuing, carrying out grinding of the tip of the Maine bevel m, and forming the side bevels S1 and S2.
[0006] Drawing 4 is the top view (drawing 5 is the B-B sectional view of drawing 4) of the blood collecting needle 11 of this invention, and the blood collecting needle 11 consists of narrow diameter element tubes 13 formed ahead of the element tube 12 and the element tube 12, forms the blade surface 14 which consists of a Maine bevel m and side bevels S1 and S2 at the tip of the narrow diameter element tube 13, and arranges the trailing edge H of a blade surface 14 on the narrow diameter element tube 13. The blood collecting needle 11 is manufactured by forming the Maine bevel m, carrying out grinding of the tip of the narrow diameter element tube 13 pulled down and processed, carrying out grinding of the tip of the Maine bevel m continuously, and forming the side bevels S1 and S2, holding the inclination stage T so that it may become thinner than the outer diameter D0 of an element tube 12, as shown in drawing 6 . The blood collecting needles 1 and 11 can make angiotomy width of face by the blade surfaces 4 and 14 at the time of a blood vessel puncture smaller than the outer diameter of element tubes 2 and 12 as mentioned above.
[0007] It is better to make it L> 0 (configuration with which H and C do not lap), since **** resistance becomes large so that it may mention later in L= 0 (configuration with which H and C lap) although the blood collecting needles 1 and 11 of this invention can set the trailing edge H of the Maine bevel m, and the distance L between the inclination start points C of element tubes 2 and 12 (the outer diameter of C location is the same as the outer diameter D0 of element tubes 2 and 12) as arbitration. The **** resistance of the blood collecting needle 21 (the example 1 of a comparison, (L= 0, the configuration where H and C lapped)) of drawing 7 (drawing 8 is the C-C sectional view of drawing 7), and the conventional blood collecting needle 31 (example 2 of a comparison) was measured in the blood collecting needle 11 (example 1) list of this invention. The result is shown in Table 1 (drawing 9 is drawing which graph-ized each data of an example 1 and the examples 1 and 2 of a comparison). It has checked that the blood collecting needle 11 of this invention had **** resistance lower than the result of Table 1 (drawing 9) on the whole as compared with the blood collecting needles 21 and 31 of the examples 1 and 2 of a comparison.
[0008]
[Table 1]

刺通抵抗値（採血針）

刺通抵抗値　（g）　↘	刃先 P	分水嶺 J	mの後縁 H	傾斜開始点 C	素管部	採血針刃の形状	
						刃外径 mm	素管外径 mm
実施例１　（本発明の採血針１１）	36.8	83.6	79.4	17.4	17.4	1.40	1.69
比較例１　（刃後縁部が傾斜開始点と重なる採血針２１）	42.4	91.8	141.4	141.4	20.6	1.40	1.69
比較例２　（従来の採血針３１）	32.0	111.8	104.2	14.8	14.8	1.69	1.69

（注）ＰＶＣシート（厚さ０．４ミリ；血管壁として想定）５か所穿刺の平均抵抗値（ｇ）
第９図にグラフ図を示す

[0009] Moreover, as mentioned above, it has checked that it was better for the blood collecting needle 21 (example 1 of a comparison) of L= 0 (configuration where H and C lapped) to have become quite larger than the example 2 of a comparison, and for the **** resistance of H (C) to set it to L> 0 (configuration with which H and C do not lap) from this. Moreover, the relation between (DJ/DBx100) and **** resistance was shown for the rate of height to the overall height DB (height from the cutting-edge tip P to H) of the Maine bevel m of height DJ (height from the cutting-edge tip P to J) of the drainage divide J formed of the Maine bevel m and the side bevels S1 and S2 of the blood collecting needle 1 of this invention in Table 2. DJ/DBx100 are understood are good to form to 50% or less from the result of Table 2.

[0010]

[Table 2]

刺通抵抗値（採血針）と分水嶺（Ｊ）の高さ（ＤＪ）との関係

刺通抵抗値　（g）　↘		刃先 P	分水嶺 J	mの後縁 H	素管部
	Ｊの高さ（%）				
実施例２（採血針１）	57	88	243	135	25
実施例３（採血針１）	31	63	122	126	24
実施例４（採血針１）	22	72	93	147	23

（注）採血針外径１．６５ミリ
ＰＶＣシート（厚さ０．４ミリ；血管壁として想定）５か所穿刺の平均抵抗値（ｇ）

[0011] Moreover, with the blood collecting needle 1 of this invention (11), it has checked that blood inflow (blood collecting rate per unit time amount) was fully securable also in [it is satisfactory in fluid study and] clinical actual condition by forming L in 1/20 from 1/10 of the

whole needle length L0.

[0012]

[Effect of the Invention] Since incision **** of a blood vessel is also small while being able to suppress small the pain given to a blood collecting person that it is easy to carry out a puncture and also fully being able to secure a blood collecting rate, the restoration of an incision blemish of the blood collecting needle of this invention is also quick.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The top view of the blood collecting needle of this invention
[Drawing 2] The A-A sectional view of drawing 1
[Drawing 3] The schematic diagram of the element tube before processing it into the blood collecting needle of drawing 1
[Drawing 4] The top view of the blood collecting needle of this invention
[Drawing 5] The B-B sectional view of drawing 4
[Drawing 6] The schematic diagram of the element tube before processing it into the blood collecting needle of drawing 4
[Drawing 7] The top view of the blood collecting needle of the example 1 of a comparison
[Drawing 8] The C-C sectional view of drawing 7
[Drawing 9] The graph which shows the **** resistance of each blood collecting needle
[Drawing 10] The top view of the conventional blood collecting needle
[Drawing 11] The D-D sectional view of drawing 10
[Drawing 12] The schematic diagram of the incision blemish of a blood vessel with the conventional blood collecting needle
[Description of Notations]
1, 11, 21, 31 Blood collecting needle
2, 12, 32 Element tube
3 13 Narrow diameter element tube
4 14 Blade surface
D0 Outer diameter of an element tube
D1 Outer diameter of the point of an element tube
D2, D3 Path of the narrow diameter element tube of the location of H
S (S1, S2) Side bevel
m Maine bevel
J The drainage divide formed from S and m
T Inclination stage
H The trailing edge of m
C Inclination start point
L Distance between C and H
L0 The whole needle length
DJ Height of J (height from P to J)
DB Overall height of m (height from P to m)
P Cutting-edge tip

[Translation done.]

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Ａ６１Ｂ	5/14	３００	0277－2Ｊ	Ａ６１Ｂ	5/14	３００Ｅ
Ａ６１Ｍ	1/02	５７０		Ａ６１Ｍ	1/02	５７０

審査請求　未請求　請求項の数２　ＦＤ　（全　５　頁）

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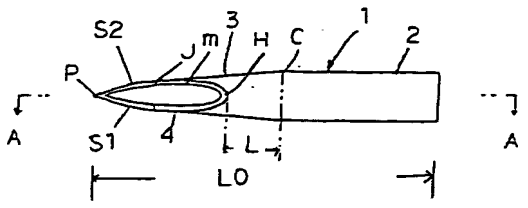
最終頁に続く

(54)【発明の名称】　採血針

(57)【要約】
【課題】穿刺しやすく採血者に与える苦痛を小さく抑えることができ、採血速度も充分に確保できるとともに血管の切開傷幅も小さい採血針を提供すること。
【解決手段】外径ＤＯを有する素管２（１２）と該素管２（１２）の前方に形成された細径の素管３（１３）より構成され、細径の素管３（１３）の先端部にメインベベルmとサイドベベルＳ１、Ｓ２を形成し、メインベベルmの後縁Ｈを細径の素管３（１３）上に配置した採血針１（１１）。



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【特許請求の範囲】

【請求項１】　外径Ｄ０を有する素管２（１２）と該素管２（１２）の前方に形成された細径の素管３（１３）より構成され、細径の素管３（１３）の先端部にメインベベルｍとサイドベベルＳ１、Ｓ２を形成し、メインベベルｍの後縁Ｈを細径の素管３（１３）上に配置したことを特徴とする採血針１（１１）。

【請求項２】　メインベベルｍとサイドベベルＳ１、Ｓ２間に形成される分水嶺Ｊの高さＤＪの割合をｍの全高ＤＢに対してＤＪ／ＤＢ×１００≦５０％に形成したことを特徴とする請求項１記載の採血針１。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は医療用具にて人体末梢静脈、動脈より採血する場合の採血針に関する。

【０００２】

【従来の技術及び発明が解決しようとする課題】従来の採血針３１は図１０（図１１は図１０のＤ－Ｄ断面図）に示すように一定の外径を有する素管３２を所定角度に研削してメインベベルｍを形成した後、研削角度を変更し素管３２を円周方向に所定角度回転させて一方のサイドベベルＳ１を研削形成し、再び素管３２を上記角度の２倍量反転させて他方のサイドベベルＳ２を研削形成する。メインベベルｍとサイドベベルＳ１、Ｓ２より形成される分水嶺Ｊのメインベベルｍ上での位置については特別の制約は無く、また血管穿刺による血管切開幅は図１２に示すように素管３２の外径一杯までなされた。

【０００３】輸血用血液あるいは血液製剤原料としての血液を人体末梢血管より採取する場合、また人工透析その他各種血液浄化療法において血液を体外循環させるため末梢血管を利用して採血し浄化後の血液を再輸注する場合に用いる針は血管穿刺抵抗が少なく円滑に刺通し、採血者に与える苦痛が少なく、単位時間当たり採血量が多く、かつ血管の損傷がより少ないことが望まれる。我が国における輸血用血液あるいは血液製剤原料としての血液は善意の献血者から無償で提供されるものであるので採血操作に伴う献血者に与える苦痛は極小とすべきである。また体外循環血液浄化療法は短期間に頻回行われることが多く患者の血管採血部位の損傷修復が速やかであるよう、血管損傷が極小であることは治療行為上極めて重要である。従来の採血針３１はこの点の配慮が十分でなかった。そこで本発明は血管に刺通しやすく採血者に与える苦痛が小さく、刺通に伴う血管切開傷が小さく血管組織損傷の修復が速く、血液流入量が大きい採血針の提供を目的としたものである。

【０００４】

【課題を解決するための手段】

［１］外径Ｄ０を有する素管２（１２）と該素管２（１２）の前方に形成された細径の素管３（１３）より構成され、細径の素管３（１３）の先端部にメインベベルｍとサイドベベルＳ１、Ｓ２を形成し、メインベベルｍの後縁Ｈを細径の素管３（１３）上に配置した採血針１（１１）を提供する。

［２］メインベベルｍとサイドベベルＳ１、Ｓ２間に形成される分水嶺Ｊの高さＤＪの割合をｍの全高ＤＢに対してＤＪ／ＤＢ×１００≦５０％に形成した［１］の採血針１を提供する。

【０００５】

【発明の実施の形態】図１は本発明の採血針１の平面図（図２は図１のＡ－Ａ断面図）で、採血針１は素管２と素管２の前方に形成された細径の素管３より構成され、素管２の外径Ｄ０より細径の素管３の先端にメインベベルｍとサイドベベルＳ１、Ｓ２からなる刃面４を形成し、刃面４の後縁Ｈを細径の素管３上に配置したものである。採血針１は図３に示すように素管２の先端を円錐状に絞り加工された細径の素管３の先端を研削してメインベベルｍを形成し続いてメインベベルｍの先端を研削してサイドベベルＳ１、Ｓ２を形成することにより製造される。

【０００６】図４は本発明の採血針１１の平面図（図５は図４のＢ－Ｂ断面図）で、採血針１１は素管１２と素管１２の前方に形成された細径の素管１３より構成され、細径の素管１３の先端にメインベベルｍとサイドベベルＳ１、Ｓ２からなる刃面１４を形成し、刃面１４の後縁Ｈを細径の素管１３上に配置したものである。採血針１１は図６に示すように素管１２の外径Ｄ０より細くなるように傾斜段Ｔを保持しながら引き落とし加工された細径の素管１３の先端を研削してメインベベルｍを形成し、続いてメインベベルｍの先端を研削してサイドベベルＳ１、Ｓ２を形成することにより製造される。以上のように採血針１、１１は血管穿刺時の刃面４、１４による血管切開幅は素管２、１２の外径より小さくすることができる。

【０００７】本発明の採血針１、１１はメインベベルｍの後縁Ｈと素管２、１２の傾斜開始点Ｃ（Ｃ位置の外径は素管２、１２の外径Ｄ０と同じ）間の距離Ｌは任意に設定することができるが、Ｌ＝０（ＨとＣが重なる形状）では後述するように刺通抵抗値が大きくなるので、Ｌ＞０（ＨとＣが重ならない形状）にしたほうが良い。本発明の採血針１１（実施例１）並びに図７（図８は図７のＣ－Ｃ断面図）の採血針２１（比較例１、（Ｌ＝０、ＨとＣが重なった形状））及び従来の採血針３１（比較例２）の刺通抵抗値を測定した。その結果を表１（図９は実施例１、比較例１、２の各データをグラフ化した図である）に示す。表１（図９）の結果より本発明の採血針１１は比較例１、２の採血針２１、３１と比較して総体的に刺通抵抗値が低いことが確認できた。

【０００８】

【表１】

2

刺通抵抗値（採血針）

刺通抵抗値　（g）↘	刃先 P	分水嶺 J	mの後縁 H	傾斜開始点 C	柔管部	採血針刃の形状	
						刃外径 mm	柔管外径 mm
実施例1　（本発明の採血針11）	36.8	63.6	79.4	17.4	17.4	1.40	1.69
比較例1　（刃後縁部が傾斜開始点と重なる採血針21）	42.4	91.8	141.4	141.4	20.6	1.40	1.69
比較例2　（従来の採血針31）	32.0	111.8	104.2	14.8	14.8	1.69	1.69

（注）ＰＶＣシート（厚さ０．４ミリ；血管壁として想定）５か所穿刺の平均抵抗値（ｇ）
第９図にグラフ図を示す

【０００９】また前述したようにＬ＝０（ＨとＣが重なった形状）の採血針２１（比較例１）はＨ（Ｃ）の刺通抵抗値が比較例２よりもかなり大きくなり、これよりＬ＞０（ＨとＣが重ならない形状）にしたほうが良いことが確認できた。また本発明の採血針１のメインベベルｍとサイドベベルＳ１、Ｓ２により形成される分水嶺Ｊの高さＤＪ（刃先端ＰからＪまでの高さ）のメインベベル＊ｍの全高ＤＢ（刃先端ＰからＨまでの高さ）に対する高さの割合を（ＤＪ／ＤＢ×１００）と刺通抵抗値の関係を表２に示した。表２の結果よりＤＪ／ＤＢ×１００は５０％以下に形成すると良いことがわかる。

【００１０】

【表２】

刺通抵抗値（採血針）と分水嶺（Ｊ）の高さ（ＤＪ）との関係

刺通抵抗値　（g）↘	Ｊの高さ（%）	刃先 P	分水嶺 J	mの後縁 H	柔管部
実施例2（採血針1）	57	88	243	135	25
実施例3（採血針1）	31	63	122	126	24
実施例4（採血針1）	22	72	93	147	23

（注）採血針外径１．６５ミリ
ＰＶＣシート（厚さ０．４ミリ；血管壁として想定）５か所穿刺の平均抵抗値（ｇ）

【００１１】また本発明の採血針１（１１）ではＬを針の全体長Ｌ０の１／１０から１／２０に形成することにより血液流入量（単位時間あたりの採血速度）は流体学的に問題なく臨床実態的にも充分に確保できることが確認できた。

【００１２】

【発明の効果】本発明の採血針は穿刺しやすく採血者に与える苦痛を小さく抑えることができ、採血速度も充分に確保できるとともに血管の切開傷幅も小さいので切開傷の修復も速い。

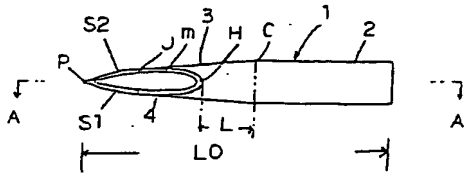
【図面の簡単な説明】

【図１】本発明の採血針の平面図

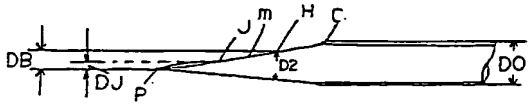
5　　6

【図２】図１のＡ－Ａ断面図
【図３】図１の採血針に加工する前の素管の概略図
【図４】本発明の採血針の平面図
【図５】図４のＢ－Ｂ断面図
【図６】図４の採血針に加工する前の素管の概略図
【図７】比較例１の採血針の平面図
【図８】図７のＣ－Ｃ断面図
【図９】各採血針の刺通抵抗値を示すグラフ
【図１０】従来の採血針の平面図
【図１１】図１０のＤ－Ｄ断面図
【図１２】従来の採血針による血管の切開傷の概略図
【符号の説明】
１、１１、２１、３１　採血針
２、１２、３２　素管
３、１３　細径の素管
４、１４　刃面
Ｄ０　素管の外径
Ｄ１　素管の先端部の外径
Ｄ２、Ｄ３　Ｈの位置の細径の素管の径
Ｓ（Ｓ１、Ｓ２）　サイドベベル
ｍ　メインベベル
Ｊ　Ｓとｍより形成される分水嶺
Ｔ　傾斜段
Ｈ　ｍの後縁
Ｃ　傾斜開始点
Ｌ　ＣとＨ間の距離
Ｌ０　針の全体長
ＤＪ　Ｊの高さ（Ｐから Ｊまでの高さ）
ＤＢ　ｍの全高（Ｐからｍまでの高さ）
Ｐ　刃先端

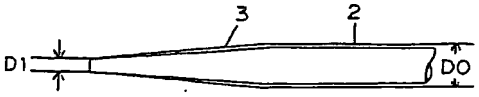
【図１】



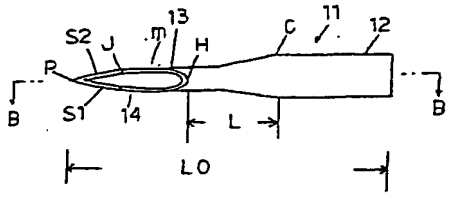
【図２】



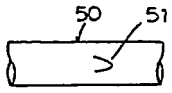
【図３】



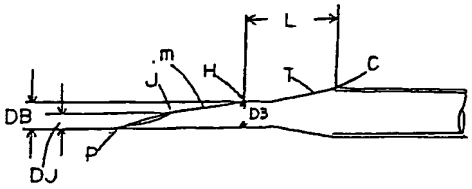
【図４】



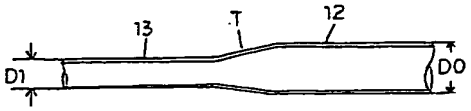
【図１２】



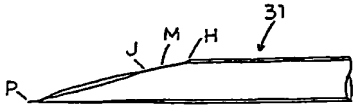
【図５】



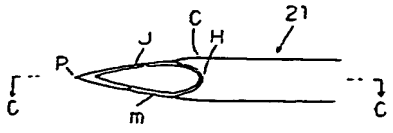
【図６】



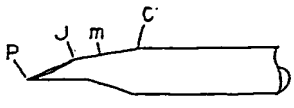
【図１１】



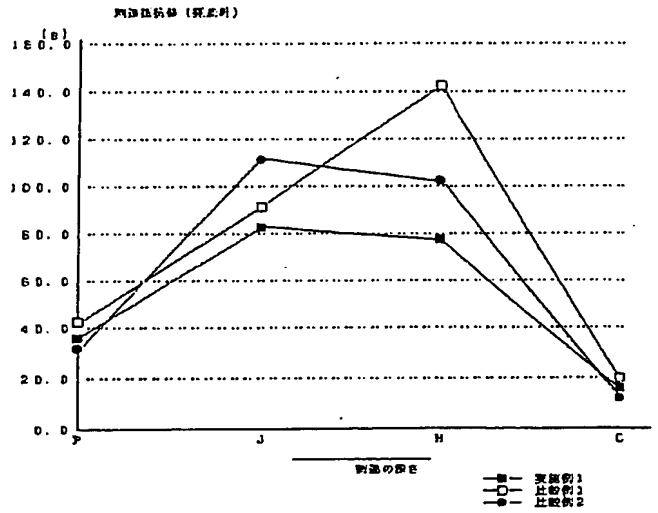
【図７】



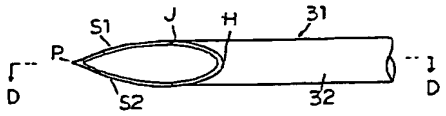
【図８】



【図９】



【図１０】



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